EXHIBIT 1

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Implementation of Section 224 of the Act;	)	WC Docket No. 07-245
Amendment of the Commission's Rules and	)	
Policies Governing Pole Attachments	)	RM-11293
	)	
	)	RM-11303
	)	

DECLARATION OF

COLEMAN BAZELON

I, Coleman Bazelon, hereby declare the following:

INTRODUCTION AND OVERVIEW

My name is Coleman Bazelon. I am a Principal of The Brattle Group, Inc. ("The Brattle Group"), an economic consulting firm. My business address is 1850 M Street, NW, Suite 1200, Washington, DC 20036. We have offices in Cambridge, MA; Washington, DC; San Francisco, CA; London, England; and Brussels, Belgium. We have approximately 200 employees. I have been employed by The Brattle Group since July, 2007. From August, 2001 through June, 2007, I was a Vice President of Analysis Group, Inc. Over the past seven years, my consulting engagements included litigation, regulatory, and arbitration matters in the wireless, wireline, and video sectors. From March, 1995 through June, 2001, I was a principal analyst in the

Microeconomic and Financial Studies Division of the Congressional Budget Office where I was responsible for telecommunications issues.

I have an M.S. and Ph.D. in Agricultural and Resource Economics from the University of California at Berkeley conferred in 1989 and 1995, respectively. I earned a Diploma in Economics in 1987 from the London School of Economics and Political Science in London, England.

I have filed several declarations before the Federal Communications Commission ("FCC"), and have served as an expert in state and federal courts on several occasions. My *curriculum vitae* is attached as Attachment A.

I have been asked by Time Warner Cable Inc. to determine which of two rates—the FCC's Cable Rate or the FCC's Telecom Rate—more closely approximates the economically efficient rate for pole attachments. To do so, I examine the characteristics of a pole attachment rate that would prevail in a hypothetically competitive market for pole attachments. The hypothetically competitive market is governed by the forces of competition that would exist absent the market failures that lead to the need to regulate the market for pole attachments in the first place. My analysis demonstrates that the FCC Cable Rate is much closer to the economically appropriate rate for pole attachments than the FCC Telecom Rate or a stand-alone cost-based rate such as the one used in Maine.

BACKGROUND

Two rates have been proposed in this proceeding to apply to a broadband attacher: the FCC Cable Rate and the FCC Telecom Rate. These two rates use very different formulas to calculate an attacher's contribution to the common costs of a utility pole. Evaluation of the rates requires some knowledge about how pole attachment fees are calculated and the various rights and obligations of utility pole owners and attachers. It is my understanding that the following information fairly characterizes the relevant economic aspects of pole attachments.

- A cable attacher is allocated one foot of useable space.[1]
- All attachers other than the pole owners and their Joint Users must pay all make-ready costs associated with their attachment.[2]
- When the make-ready costs include any upgrade to a pole, such as replacement with a larger pole, the pole owner receives all of the ownership benefits of the upgrade.[3]

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1 I understand that the actual space used by a cable attacher may be less than one foot, but that allocating a cable attacher a minimum of one foot is the accepted practice. Declaration of Veronica MacPhee, Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, March 6, 2008 (herinafter "MacPhee"), pp. 17-18

2 I use the term "Joint User" to refer to a party to a "joint use" agreement, as discussed in the Comments submitted to the FCC in this proceeding. *See* MacPhee, pp. 2-3. Report of Patricia D. Kravtin, Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, RM11293, RM11303, March 6, 2008 (herinafter "Kravtin"), *, p. 30.*

3 *See* Comments of Comcast Corporation Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, March 7, 2008, p 19.

- Pole owners consider the potential needs of Joint Users in designing their poles but do not generally consider the needs of potential tenant attachers such as cable operators and competitive local exchange carriers (CLECs) in designing their poles.[4]
- Pole owners and their Joint Users have superior rights compared to licensee attachers, including:
  - ▶ The ability to reserve space for future use[5]
  - ▶ The ability to design poles to meet their needs and the lack of need for make-ready[6]
  - ▶ The ability to avoid a formal application process[7]
  - ▶ Indemnification from the attacher.[8]
- Pole owners today typically need at least Class 5, 40' poles to accommodate their attachment needs and those of their Joint Users.[9]
- Cable attachers typically need Class 5-7, 25' foot poles to accommodate their attachment needs.[10]

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4 *See* Comments of Knology, Inc., Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, March 7, 2008, p. 6.

5 *See* Comments of the Concerned Utilities, Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, March 7, 2008 (herinafter "Concerned Utilities"), p. 55.

6 *See, e.g.*, Concerned Utilities, p. 53; Comments of Florida Power & Light & Tampa Electric Company, Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, March 7, 2008 (hereinafter "Florida Power & Light"), p. 5.

7 *See, e.g.*, Concerned Utilities, p. 54; Florida Power & Light, p. 5.

8 *See* Comments of Time Warner Cable Inc., Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, RM11293, RM11303, March 7, 2008 (herinafter "Time Warner Cable Comments"), pp. 16-17.

9 *See* MacPhee, ¶40.

10 A cable attachment is typically attached at 18 feet above the ground, and approximately 5 ½ to 6 feet of the pole is buried in the ground. *See Implementation of Section 703(E) of the Telecommunications Act of 1996*, 12 F.C.C.R. 11,725, 11,732, (Rel. February 6, 1998) ¶ 22 (explaining "the NESC guideline that 18

THE ECONOMIC RATIONALE FOR REGULATING POLE ATTACHMENTS

The economic rationale for regulating the market for pole attachments is based on failures in that market that prevent it from enjoying the efficiencies of competition. A competitive market allows participants to make all mutually beneficial trades. It uses price signals to efficiently allocate resources so that no gains from trade go unrealized. Well-working market forces ensure that the price of a good or service will signal its relative value compared to other goods and services. The great advantage of well-working price signals is that efficient decentralized coordination of economic activity can occur.[11]

When a market does not operate under competitive forces, price may no longer signal relative values of goods and services. For example, a firm that possesses market power may restrict the

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feet of the pole space must be reserved for ground clearance and that six feet of pole space is for setting the depth of the pole"). A 25 foot pole will thus be tall enough for a single cable television attachment.

11 The following explanation of the price system from F. A. Hayek is instructive.

> It is worth contemplating for a moment a very simple and commonplace instance of the action of the price system to see what precisely it accomplishes. Assume that somewhere in the world a new opportunity for the use of some raw material, say tin, has arisen, or that one of the sources of supply of tin has been eliminated. It does not matter for our purpose-and it is very significant that it does not matter-which of these two causes has made tin more scarce. All that the users of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere, and that in consequence they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favor of what other needs they ought to husband the supply. If only some of them know directly of the new demand, and switch resources over to it, and if the people who are aware of the new gap thus created in turn fill it from still other sources, the effect will rapidly spread throughout the whole economic system and influence not only all the uses of tin, but also those of its substitutes and the substitutes of these substitutes, the supply of all the things made of tin, and their substitutes, and so on; and all this without the great majority of those instrumental in bringing about these substitutions knowing anything at all about the original cause of these changes. The whole acts as one market, not because any of its members survey the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all.

F.A. Hayek, "The Use of Knowledge in Society," American Economic Review, p. 526 (September 1945).

supply of a good to increase its price and the associated profits. In that case, the price of the restricted good will send a false signal about its relative scarcity which will induce market participants to use an inefficiently small amount of the good. Similarly, an ill-functioning market that leads to too low of a price for a resource will lead to its overuse.

The market for pole attachments[12] has two distinct features that undermine the possibility of competitive outcomes. Both result in the pole owner possessing market power and the ability to maintain an inefficiently high price. Absent these market failures, the pole owner would not have the ability to manipulate market prices and send false economic signals about relative resource values.

The first market failure that contributes to the existence of market power is the existence of barriers to entry. This market failure is in part a creation of government. Many local governments limit the number of pole lines that may be erected. In addition, rights-of-way for the construction of pole networks are limited. Additional demand for rights-of-way is unlikely to lead to an increase in the supply of rights-of-way. The resulting lack of space to build duplicate networks is a supply restriction. The end result, whether due to a physical lack of space or government imposed restrictions, is that entry, or the threat of entry, is absent from the market for poles and pole attachments. Without the threat of entry to police excessive pricing of pole attachments, this market faces monopoly provision of pole attachments by the firm that has access to the rights-of-way.[13]

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[12] The economic good in question in this analysis is the ability to attach to a pole, referred to as the pole attachment service. Pole networks are the means to providing attachment services.

[13] For monopoly provision of an input such as pole attachment services to lead to market power it must also be the case that the attachers have no reasonable alternatives to using the pole owner's poles.

A second distinct cause of market power is that utility poles have high fixed costs and low marginal costs for attachments. This implies that average costs are steeply declining—a hallmark of natural monopolies.[14] When average costs decline as more of a good or service is provided, efficient provision tends toward a single firm. Hence, the 'natural' derivation of a monopoly. This implies that even in the absence of barriers to entry, the economics of owning utility poles and providing attachment services would lead to a natural monopoly and, consequently, the pole owner would still have market power.

Given these two distinct market failures—barriers to entry and the existence of natural monopoly in poles—and the market power they create, an unregulated market cannot be relied upon to price pole attachment services at the efficient level.

GETTING THE PRICE SIGNAL RIGHT MATTERS

Correcting for the market failures noted above is important for economic efficiency. A price that sends a false signal about the relative value of economic resources causes distortions in the decisions made by firms receiving the distorted signals. To the extent decisions are already made and investments are sunk, price signals will not so much change behavior on the margin, as they will largely constitute a transfer from one firm to another. However, there are always future decisions to be made and future investments to be sunk, so even 'simple transfers' can have long term impacts. Equally important, prices that do not replicate those of a competitive market will affect the delivery of services by the firms using the facility or product.

[14] Jean Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION, MIT Press, Cambridge (1988), p. 19.

When price signals are erroneous, firms may over-use or under-use resources. In the market for pole attachment services, for example, if the charge for attaching to a utility pole was set at $0.01 per pole, cable companies and other potential attachers would under-value the economic resources they consume when they attach to a pole.[15] Conversely, a charge set at $100 per pole would inefficiently deter the use of poles, and would artificially restrict the provision of cable and other services provided by the attaching parties.

Under most franchise agreements, cable systems are not required to offer video service in areas where the density of homes is below some threshold and typically have no obligation to offer broadband or voice services such as VoIP. CLECs have no requirements as to where they offer service. Cable companies and CLECs, therefore, will provide services to homes in areas that they are not required to only when it is profitable to do so. Unless a cable system is providing video and data services to every home in its franchise area, it has reached the economic margin where the costs of extending the service to an additional household exceeds the revenues expected from that household. That economic margin is determined by all costs (and revenues) including the costs of attaching to poles.

If the price signals of all of the inputs needed to provide video and data services are correctly priced, then the cable company will choose the margin based on correct economic signals. If the prices charged for pole attachments for a particular service are too high, the edge of that service area will not reach as far as it should. Moving from pole attachment charges based on the FCC

[15] Note that in this case, an annual rate of a penny per pole would not likely cover the incremental costs associated with attaching to the pole. Consequently, such a rate would fail the most basic tests of economic efficiency.

Cable Rate to ones based on the FCC Telecom Rate will have a significant impact on the potential profitability of building out to a household. One analysis suggests the impact on costs in rural areas would be as much as $20.75 per month for a typical rural subscriber.[16] With a monthly bill of between $50 to $100 for video (basic and digital respectively) plus data services, a change to the FCC Telecom rate could raise the costs to serve these customers by more than 20% to 40% of revenues. Such a large increase in costs will obviously have a significant impact on the profitability of serving all customers, but the impact will be most keenly felt on the truly marginal customers that are currently only barely profitable to serve.

The effect of the higher costs to serve marginal customers can be realized in both a decrease in service to existing customers and, more significantly, a halt in the extension of service to new customers.[17] Cable systems are less inclined to discontinue service immediately to customers that currently receive services (video and/or data) because much of the total investment required to offer service is sunk. Sunk investments are ones that are not easily undone. An investment that can be sold to recover most of its value is not sunk. Installed cable plant serving unprofitable customers is largely sunk because it would have a relatively low scrap value and would be difficult to recoup investments by selling it as a going concern. Therefore a cable operator cannot easily get its money out of the system and may find it most profitable—in the sense of minimizing its losses—to continue operating, even when it regrets making the investment in the first place.

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16 Comments of Charter Communications, Inc., Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, RM11293, RM11303, March 7, 2008 (hereinafter "Charter Comments"), Exhibit B.

17 *See* Charter Comments, pp. 5-6.

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17 *See* Charter Comments, pp. 5-6.

An attacher that made investments based on the price signals from existing regulation may regret that decision, and one might argue that there is something wrong when a regulator encourages investment in a sunk cost through one regulated price for an essential input, and then renders that investment uneconomic by later substantially raising the input's price. From an economic perspective, however, it is more important to realize that any consideration of raising charges for access to sunk investments—including the current proceeding—increases the uncertainty about the course of future charges. In general, the greater the risk of unfavorable cost developments, the greater the expected return that is required before sunk investments are profitably made. Consequently, even if the FCC does not raise its Cable Rate, the mere fact of this proceeding will increase uncertainty over future costs, raise the bar for profitability of marginal customers and, consequently, discourage the future deployment of data services. Of course, if the FCC were to actually raise the price in this proceeding, the long-term impact on investment in sunk costs that rely on that price would be worse.

As a consequence of the sunk nature of investments already made to serve households, the largest impact of inflated prices will likely be on extending new services. According to the NCTA, about 5.7 million homes passed by cable are yet to receive the option of broadband data services.[18] It is these homes that are most in jeopardy of not being offered broadband services if the cost of providing those services increases due to an increase in pole attachment rates.[19]

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18 123,400,000 homes passed by cable less 117,700,000 homes passed by cable high-speed data services leave 5,700,000 homes passed by cable that are not offered high-speed data services. (Available at http://www.ncta.com/Statistic/Statistic/Statistics.aspx)

19 *See* Charter Comments, pp. 5-6.

The impact of an uneconomically high charge for pole attachments on existing cable plant is largely a transfer of wealth from the owners of the cable company to the owners of the poles. Of course, over the longer term, investments are required to renew cable plant and those not-yet-sunk investments may be deterred if the higher pole attachment charges diminish profitability. To the extent that the price for pole attachments is raised by a regulator after that regulator has encouraged sunk investments based on the prior lower price, a cable operator who regrets making at least a portion of that investment will 'un-invest' by depreciating its plant.

From the pole owners' perspective, the investment they make in poles is also largely sunk—low scrap value and difficulty finding a buyer for the asset in times of duress—but *not* with respect to cable company attachments. This is because the pole owners make no cable-specific investments in their pole networks—all cable-attacher-specific investments are fully paid for by the cable attachers themselves through make-ready charges. In other words, the pole owner gives nothing up when a cable company attaches to its poles. If a cable attacher leaves a pole, the only stranded investments are ones paid for by the exiting attacher.

THE SHARED NATURE OF UTILITY POLES IS THE HEART OF THE PROBLEM

Given the monopoly provision of pole attachments, as explained above, economic reality requires that poles should be shared.[20] All parties using the poles benefit from shared use as well. If there is excess space on a pole and a new attacher pays its incremental costs of

[20] It is interesting to observe that in the cellular phone industry similar economic benefits from sharing cell towers exist. In that industry, however, the market trend has been to structurally separate ownership through divestment of the cell towers to independent tower companies that do not have incentives to favor one attacher over another.

attachment, no other user of the pole, including the pole owner, is made worse off by the additional attachment. In fact, to the extent an attacher pays anything more than its incremental costs, it is making a contribution to the fixed, common costs of the pole, and the pole owner is actually better off as a result of third-party attachment. However, where there are a number of attachers on a pole, how those attachers allocate the relative benefits that they all receive from attachment can be contentious.

Because economic theory and regulatory practice call for each pole user to pay for the costs exclusively related to that user's attachment, the heart of the problem in determining pole attachment rates is how to divide the common costs of the pole. In dividing up the common costs associated with poles, viewpoints differ as to how much of the common burden each attacher should bear.

When the total costs of providing a good or service can be fully attributed to units of output, charging a price equal to marginal cost is universally accepted as the most efficient approach. However, in the presence of large, common or fixed costs (hereafter referred to as common costs[21]) that are not attributable to any one user of the common resource, a firm will not recover its total costs if it prices at marginal cost. As noted above, this can be particularly true for natural monopolies—that is, firms characterized by decreasing average cost over the relevant range of output.

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21 A fixed cost technically refers to a cost that does not vary with the level of output. In the current context, fixed costs would be the costs of the pole that do not vary with the number of attachers. Common costs are a subset of fixed costs and are incurred in the production of more than one product or in the provision of services to more than one consumer. The common costs of poles generally refer to the unusable portion of the pole although I use the term below to refer to the unused portion of the pole. Common costs do not diminish when one of the goods (or one of the consumers) is no longer produced (served).

I agree with Patricia Kravtin's conclusion that because the pole owner does not make any investment in poles in order to meet any needs of cable operators, there is no specific issue about investments in pole networks not being made even if cable attachers do not contribute toward common costs. Nevertheless, it is useful to consider how to properly allocate the common costs where pole investments would be made regardless of a cable operator's needs. The price should strive to balance the inefficiency inherent in charging a price greater than marginal cost with the need of the firm to cover its total costs in order to remain viable. How common costs are allocated among units of output or between consumers of the good or service as well as the magnitude of the common costs will determine the extent to which the outcome is economically appropriate.

On a theoretical level, economic analysis provides an answer to the question of how to allocate a common cost. The proper method is to use a "but-for" competitive price. For pole attachments, that price will include a unique division of common costs and will depend on relative supply and demand conditions and the assumption of competitive pressures. On a practical level, however, there are several approaches to allocating common costs.

Appendix A provides a review of the numerous approaches to allocating common costs. Some approaches are based on relative value to the users of the common resource, with the Ramsey pricing method as the most notable.[22] Two-part tariffs that apply an equal division of the common costs represent another demand-side allocation method. A version of this latter method

22 In the Ramsey pricing approach, marginal costs are marked up so that total costs are recovered. The mark-up over marginal costs is in inverse proportion to the elasticity of demand (price sensitivity) of the purchaser of the good or service.

is used for allocating the common costs in the FCC Telecom Rate formula. Other approaches to allocating common cost are based on attributable costs of one type or another. Included in this set of approaches is proportional pricing, which assigns common costs in the same proportion as attributable costs. The FCC Cable Rate is a variation on this approach. Based on the analysis of Patricia Kravtin, the difference in practice is between 7.4% of the common space for a typical cable attachment (based on the FCC's assumption that the average pole is 37 ½ feet long and has 13 ½ feet of usable space) and between 13% and 22% of the common space for a telecom attachment (again assuming a 37 ½ foot pole with 13 ½ feet of usable space, as well as 24 feet of common space).[23]

THE BUT-FOR COMPETITIVE STANDARD FOR ALLOCATING COMMON COSTS

An objective standard is needed to choose among the different approaches to dividing common costs. The market failures that create the need for regulation in the first place can inform an objective standard. That standard is characterized by the competitive prices that would exist <u>but for</u> the market failures that lead to regulation. In other words, we can use the prices that would prevail in a hypothetically competitive market for pole attachment services. The hypothetical nature of the market is focused on analyzing the prices that would emerge if pole owners did not have market power.

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[23] In both the FCC Cable formula and the FCC Telecom formula, the attacher is charged the share of the usable space it uses. This means that the total cost of a pole (used space plus common space) is 7.4% under the Cable Rate and between 11.2% (5 attachers) and 16.9% (3 attachers) under the Telecom Rate. *See* Kravtin, pp. 33 & 35.

Several features can be identified that would exist in a but-for competitive market for pole attachments. It is worth noting that the owner of a pole charges prices to attachers and implicitly charges itself a price as well—the difference between the cost of the poles and the amount of money recovered from other attachers. In practice, pole owners typically charge for attachments to a given pole based on one of three calculations: joint use agreements (which largely entail in-kind transfers between firms), the FCC Telecom Rate and the FCC Cable Rate.

In thinking about the but-for competitive price, a convenient analytical device is to consider a hypothetical firm in the pole attachment services business that charges all attachers (including the actual pole owner) and operates under the constraints of a competitive market. This approach aids the analysis by explicitly recognizing that the pole owner wears two hats in the pole market: one as the pole owner and one as a pole user. It is worth noting that the fact that the investments made to serve the electric utilities and ILECs are sunk means that the charges they pay (to themselves) for use of the pole networks includes a premium that compensates the pole owner (themselves) for making irreversible investments.

Comparing the FCC's Telecom and Cable rates to those of the hypothetical pole owning firm reveals the extent to which they are consistent with the but-for competitive rates. To the extent the FCC's Cable or Telecom rates are higher than the but-for competitive rate, they are consistent with a market in which the pole owner is exercising market power.

The first relevant characteristic of a competitive price is that there would be no excess, or economic, profits in the long run. In a competitive market, excess profit induces entry that competes the excess profits away. This constraint means that total revenue, including the revenue the pole owner pays to itself, covers the total cost of providing the pole attachment services, but no more.

A second characteristic of a competitive market relevant to a rate structure for pole attachments is that each attacher would pay the direct costs it incurs. As noted above, this is the accepted methodology for allocating costs that can be directly attributed to an attacher and is consistent with the practice that tenant attachers pay the make ready costs associated with their attachments. The rate that the Joint User pays, and that the pole owner implicitly pays itself, must be high enough to account for this cost—which only the Cable operator and CLEC pay outside of the rental rate. The value to the tenant attachers of the common pole space, therefore, is net of the individual direct costs they cause and pay for. (The value to the pole owner and the Joint User, on the other hand, would not be net of the direct costs that they cause.)

The third characteristic of competitive markets applicable to pole attachment rates is that the common costs of the pole are shared by all users in proportion to how much they value their attachments. This is related to the Ramsey pricing discussion in Appendix A. Those attachers that value the attachment services more will pay a larger share of the common costs associated with a pole. This is the economically efficient outcome because it minimizes the distortion in attacher behavior created by having to charge a price above marginal costs in order to recover the common costs.

Applying characteristics of the competitive outcome to the market for pole attachments will lead to something that resembles Ramsey pricing. However, as discussed in Appendix A, the informational requirements of applying a Ramsey pricing scheme are often too demanding. A practical simplification of the Ramsey pricing approach is to allocate common costs in proportion to the value to or cost incurred by each user. Here measures of cost or value stand as proxies for the more complicated measures required to fully implement the Ramsey pricing approach.

IMPLEMENTING THE BUT-FOR STANDARD

One approach to dividing common costs consistent with the but-for competitive standard is based on the relative values each attacher places on using the pole. Although we do not have the means to estimate demand schedules for each attacher, a reasonable alternative, more in line with the level of analysis currently used in calculating pole attachment rates, is to use other measures of value as a proxy for a fully specified demand schedule.

Specific evidence of relative value exists. The amount of space consumed by each attacher is one indicator of value, as is the security of their rights to attach. Electric utilities typically use the majority of the available space on a pole, and the ILEC Joint Users also use more space than do cable operators and CLECs. According to AT&T expert MacPhee, for example, the electric utilities typically use from 8 to 12 feet of usable pole space, the ILECs use from one to two feet, while the cable operators and CLECs use only one foot.[24] In addition, the pole owners and their Joint Users (electric and ILEC) have more valuable attachment rights than cable or CLEC

[24] *See* MacPhee, ¶¶ 17-18.

attachers. Other things being equal, this greater attachment right makes any given attachment more valuable.[25] Combined with the greater amount of space used, this suggests the pole owners and their Joint Users more highly value the attachment services they use compared to a cable attacher.

An alternative approach to dividing common costs is based on the relative costs caused by each attacher. This approach uses cost as a proxy for value. In a hypothetically competitive market where a price significantly above costs induces competition that lowers prices, relative costs will track relative values. Attributable costs can be measured by the relative amount of space used by an attacher.

Viewing cost causation more broadly, cable and CLEC attachers cause much less common space, including unused usable space, than the pole owner and its Joint User. The tenant attachers need relatively smaller and less expensive poles, whereas the large and more expensive poles actually in use are designed to meet the needs of the pole owners and their Joint Users, whose equipment takes up more space and must be attached higher on the poles. These larger poles create greater common costs. The cost difference between a 40' pole and a 25' pole, for example, can be in the ratio of three-to-one.[26]

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25 The hypothetical pole owning firm would inevitably charge a higher price for a more perfected attachment right compared with a less perfected one.

26 *See* Reply Comments of Time Warner Cable Inc., Before the Federal Communications Commission, In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments, WC Docket No. 07-245, RM11293, RM11303, April 22, 2008 ("Time Warner Cable Reply Comments"), Exhibit 2.

The costs incurred by the pole owners and Joint Users can be viewed as the incremental cost of a full-sized pole over the cost of a cable-only pole.[27] Conversely, they can be viewed as the cost of a full-sized pole after taking account of the savings of not having to construct a cable-only pole.[28] Regardless of the direction of the analysis, however, it is clear that the difference in cost between a cable-only pole and a current full-sized pole should be allocated to the pole owners and their Joint Users whose needs required (caused) the larger pole. The cost of a stand alone cable pole measures the savings or economic surplus generated by sharing the pole. This gain from sharing the resource should be shared among all attachers.

These analyses all point to using the relative amount of used space consumed by each attacher as a proxy for the relative value of attachment services, with a recognition that this may somewhat over allocate value to the cable attachers and somewhat under allocate value to the pole owners and their Joint Users due to differences in attachment rights. To illustrate, take a 40' pole with 16' of usable space and 24' of unusable space. (Based on the Comments before the FCC, it appears that a 40' pole is now more typical than the 37.5' pole assumed by the FCC in its rate formulas.)[29] If all 16' of usable space are used, the economically appropriate rate described here gives the same answer as would the FCC Cable Rate (based on a 40' pole). In the case of a fully occupied pole, the cable attacher uses 1/16 of the usable space and is charged a similar proportion of the unused or common space, for an effective rate of 6.25% of the overall pole costs.[30] This is also the amount an attacher would pay under the FCC Cable Rate methodology

27 *See* discussion of Incremental Costs approach to allocating costs in Appendix A.
28 *See* discussion of Avoided Costs approach to allocating costs in Appendix A.
29 *See* MacPhee, p. 17.
30 1/16 = 0.0625. 6.25% * (16/40 of the pole cost in used space) + 6.25% * (24/40 of the pole cost in unused space) = 6.25% of total cost of the pole.

for this size average pole. Now suppose the same pole had only 13' of used space.[31] Economically, the unused space is now 27' (24' of unusable space plus 3' of unused, but usable, space). In this case, the economically appropriate rate is now 1/13 of the cost of the (smaller) used space plus 1/13 of the cost of the (now larger) common space. The net result is a rate of 7.69%.[32] The FCC Cable rate would remain 6.25% of the pole costs under these alternative assumptions.

Under the FCC Telecom Rate an attacher pays between about 10.5% and 16.0% of the total costs of a 40' pole (with 3 and 5 attachers, respectively) and under the FCC Cable Rate, typically pays 7.41%, but in the example of the 40' pole would pay 6.25% of the total costs of the pole. The economically appropriate rate in this case is 7.69%. Not only is the correct rate much closer to the FCC Cable Rate, but consideration of the less perfected rights the cable attacher receives suggests the FCC Cable Rate may in fact overcharge for attachment services.

Although the economically appropriate formula increases with less usage of the pole, so does the FCC Telecom Rate because fewer feet of used space will generally correlate with a fewer number of attachers on the pole. The economically appropriate rate will rise with less used space, but so will the FCC Telecom Rate as the number of attachers declines. Consequently, the conclusion that the FCC Cable Rate is closer to the economically appropriate rate is robust to different assumptions about the usage—in used space and number of users—of poles.

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[31] 13' of used space is a reasonable assumption. Kravtin provides an example of a 40' pole with 15.5' of used space. *See* Kravtin, note 34. MacPhee notes 9.5' to 11' are used by Joint Users alone. *See* MacPhee, Exhibit VMM-1.

[32] 1/13 = 0.0769. 7.69% * (13/40 of the pole cost in used space) + 7.69% * (27/40 of the pole cost in unused space) = 7.69% of total cost of the pole.

THE MAINE APPROACH DOES NOT MEET THE BUT-FOR COMPETITIVE STANDARD

A rate, such as the one in Maine, that shares pole costs in proportions based on each attacher's stand alone-costs of building a pole, would be unlikely to approach the but-for competitive charges. This approach uses the stand-alone cost for a pole for each attacher as a proxy for the value each attacher places on the attachment services it receives from attaching to the shared pole. This is in contrast to the economically appropriate rate that uses the proportion of used space as a proxy for that value. Only if the relative stand alone cost of poles mirrored the relative amount of space used on a pole would this approach provide an economically appropriate answer.

The stand-alone cost approach has several other problems. As noted in Appendix A, this approach is most appropriately used when common costs are a relatively small portion of total costs. This is not the case with pole attachments. Another cause for concern is that it is unlikely that stand alone costs are proportional to the amount of space used on a pole because the costs of poles do not increase in linear proportion to their size. For example, the cost of a Class 5, 40' pole is three times the cost of a Class 5, 25' pole[33], but is less than twice its size. An additional problem is that this proxy for value gets at the wrong measure of cost. Given the large amount of common costs associated with unused portions of poles, the price differences reflect an increase in common costs—more properly attributed to the users that cause those increases—in addition to any increases in costs narrowly associated with used space.

[33] *See* Time Warner Cable Reply Comments, Exhibit 2.

Furthermore, even if stand alone costs were in proportion to space used, it would likely misrepresent value for two reasons. First, the cost of a stand-alone cable pole very likely overstates the value a cable attacher places on cable attachments. Unlike pole owners and their Joint Users, the cable industry has never revealed a demand for pole attachment services that even comes close to its own stand alone cost of a pole. Surely, many poles, especially toward the edges of networks, would be uneconomical to build on a stand-alone basis. Consequently, the stand-alone cost overstates the cable attacher's willingness to pay for pole attachments. Second, the stand alone cost of a pole to a pole owner and its Joint User likely underestimates the relative valuation they place on the ability to attach to the poles because the cost of the pole takes no account of the more secure property rights in the pole they receive.

Finally, the rates created by a relative stand alone cost approach are clearly too high. Maine charges rates to cable operators of 25% when three attachers are present[34], well above the economically appropriate rates discussed above.

CONCLUSION

In conclusion, appropriate economic analysis would look to the but-for competitive market in considering how common costs would be allocated among pole attachers. Based on the relative value of the attachments to their users and cost causation principles, the proper share of the common costs of the pole would be borne by the parties in relation to their use of used space on the pole, considering as well the security of each party's attachment rights. Although this analysis is slightly different from the Cable Rate used by the FCC, in that the FCC looks to the

[34] 1993 WL 559845 (Me.P.U.C) § 5.D.2.

percentage of "usable" space used by the attacher, and a competitive but-for market would look to the percentage of "used" space used by the attacher, the result is close to the FCC Cable Rate result, especially taking into account the effect of the reduced security of the attachment rights held by the cable and CLEC attachers. Indeed, to the extent that the usable space on poles is largely now used, it appears that the FCC Cable Rate may overstate the appropriate attachment rate. Furthermore, there is no reason to suspect that the allocations resulting from the FCC's Telecom Rate would be approached using the proper but-for competitive market analysis.

As another alternative, the Maine Commission's approach is not supportable economically because it overstates the relative values that the different attaching parties place on their attachments, both based on their use of pole space and the security of their respective rights.

Appendix A

OTHER APPROACHES TO SHARING COMMON COSTS

Alternatives for allocating or dividing common costs between users of a resource include, but are not limited to, Ramsey pricing[35], equal division, proportional pricing, stand-alone costs, incremental-costs and avoided costs allocation. Some approaches are used in consumer markets, others with business customers or in wholesale markets and others in all types of markets. Nevertheless, the economic insights of these pricing formulas can be translated from one type of market to another.

Theoretically, these methods can be divided into two categories. In the first are methods that allocate common costs based on the relative value of the resource to its users, including Ramsey pricing and equal division. In the second are pricing methods based on relative costs attributable to each user, including proportional pricing, stand-alone costs, incremental-costs and avoided costs allocation.

Allocating common costs based on relative value

Ramsey Pricing. Ramsey pricing is the economists' favored method for allocating common costs. It relates the share of fixed cost each purchaser pays to the marginal costs that purchaser incurs, but adjusts it for that purchaser's price sensitivity. Under Ramsey pricing, purchasers are charged a markup over marginal cost in inverse proportion to their demand elasticity. Thus,

[35] F. Ramsey, "A Contribution to the Theory of Taxation." 37 *Economic Journal*, 1927, pp. 47-61.

those least responsive to price changes, purchasers with inelastic demand, bear the largest burden of the common costs. This has the effect of minimizing the distortion in the quantity of good or service purchased. Hence, because it changes behavior the least it is the most economically efficient common cost recovery formula.

If all customers are alike, Ramsey pricing reduces to a fixed percentage mark-up over marginal cost. This is rarely the case. In the more general setting, Ramsey pricing requires knowledge of the demand functions of the purchasers, potentially limiting its practical application. The full set of information requirements tends to be more demanding than is practical in many situations. A further potential objection to Ramsey pricing is that if a small set of purchasers are fairly price-insensitive and they represent a relatively small share of the market, they may be assigned a large enough share of the common costs that they will leave the market. The remaining purchasers who are more price sensitive must then make up these costs, leading to greater inefficiency.

A sample of proposals for use of the Ramsey pricing method for allocating common costs includes:

- The U.S. military's defense of oil shipments in the Persian Gulf:[36]

  In an effort to estimate the pattern of government support for "dirty" energy, Greenpeace commissioned Industrial Economics, Inc. to access the cost of defending oil shipments in the Persian Gulf.[37] After establishing the U.S. military's total defense costs for the

[36] Douglas Koplow and Aaron Martin, "Fueling Global Warming: Federal Subsidies to Oil in the United States," prepared for Greenpeace, June 1998 (hereinafter "Koplow").

[37] The United States government has effectively subsidized the oil market such that the price of oil does not fully reflect this supply-side risk.

Middle East, Industrial Economics, Inc. evaluated means by which to bound and allocate common costs between the three primary military activities in the region: securing oil supplies, maintaining regional stability and "preventing the emergence of regional hegemonic powers."[38] Dividing up the common costs using the Ramsey pricing model involved estimating the elasticity of demand for the three activities. In this case, the elasticities were assumed to be equal and Ramsey pricing resulted in an equal allocation of the common costs between the activities;

- The Federal Aviation Administration's air traffic services:[39]

  The Federal Aviation Administration revealed that in 1997 55% of their total costs, approximately $4.8 billion, were not directly attributable to any user and were therefore "common" costs that needed to be allocated amongst users in order for the FAA to break even.[40] In an attempt to divide those costs, the FAA's contractor employed the Ramsey pricing method, assigning the Department of Defense, an inelastic consumer of air traffic services, approximately 9% of the common costs, significantly more than the 2.6% of total costs directly attributable to them; and

- The Airservices Australia's Aviation Rescue and Fire Fighting (ARFF) services:[41]

  While some costs may be charged to airports, airlines or passengers based on their incremental or avoidable costs, Airservices Australia argues that the large sunk costs

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38 *See* Koplow, pp. 4-7.

39 United States General Accounting Office (GAO) Report to Congressional Committees, Executive Agencies, and the National Civil Aviation Review Commission, "National Airspace System: Issues in Allocating Cost for Air Traffic Services to DOD and Other Users," GAO/RCED-97-106, April 17, 1997 (hereinafter "GAO"), pp. 34-35.

40 *See* GAO.

41 AirServices Australia, "Aviation Rescue and Fire Fighting Services: Options for Charging" (2005).

associated with providing ARFF services would be most efficiently recovered through a variation on Ramsey pricing (Ramsey-Boiteux).

Equal Division. A second approach to allocating common costs based on the relative value of the good involves an equal division of costs among all consumers irrespective of the quantity consumed by each. This is more appropriate the more similar are all purchasers of the good or service. The effect of this is that those who purchase a larger quantity of the good or service pay a lower average price than those who purchase a smaller quantity—in essence, a quantity discount.

In practice, the equal division approach to cost allocation amounts to a two-part tariff. Customers pay a uniform fixed fee plus a variable charge based on level of the good or service purchased.[42] A variable charge equal to marginal cost eliminates deadweight loss but necessitates that the revenue generated across all consumers through the fixed fee equal the common costs. However, the fixed fee will drive some consumers from the market. To balance the loss of consumers against the creation of deadweight loss, an optimal two-part tariff consists of a variable price above marginal cost and a fixed fee which, while still excluding some consumers from the market, totals less than the common cost when summed across all remaining consumers. Some natural monopolies, such as utilities, price using a two-part tariff. Telecom rates for pole attachments are set using this method.

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[42] Although all other approaches to cost allocation can be broken down into two components – marginal cost plus a portion of common costs – only equal division necessities that all consumers are charged a equal surcharge to cover common costs. For instance, in Ramsey pricing, the fixed fee would be dependent on consumers' elasticities of demand and only in the rare case of equal elasticities of demand will the fixed fee be the same for all consumers. The fees at state fairs are an example of a two-part tariff using the Ramsey pricing approach. The fixed entry fee varies depending on the age of the entrant, while the variable fee is dependent on the number of rides taken by the entrant.

Allocating common costs using Ramsey pricing or equal division, both demand-side approaches, is inherently price discriminatory. Whether based on demand elasticities or on consumption of the good, prices faced by consumers are dependent on revealed preferences. Price discrimination, the practice of sellers charging different customers prices that are not in proportion to marginal cost, is typically used to extract more revenue from a market than could be extracted with a uniform price.

Allocating common costs based on relative Cost

The second category of approaches to allocating common costs is based on the relative costs attributable to each purchaser. Here, costs are used as a proxy for value.

Proportional pricing. This approach entails allocating common costs in proportion to directly assignable costs. Consequently, the percentage of attributable costs associated with each customer is used to apportion the common costs among customers. Examples of proportional allocation include the division of costs associated with common spaces in office and apartment buildings, malls, and airport terminals.[43] Cable rates on pole attachments are also set using this method.

Stand-alone (or replacement) cost method. Stand-alone costs refer to the costs of producing a given good independently of all other goods. The stand-alone costs include a mix of direct costs and costs that would be common or shared in a joint-use scenario. This method allocates

[43] *See* Kravtin, p. 40.

common costs in the same ratio as the stand-alone costs. If common costs are relatively small, and direct costs make up the majority of the stand-alone costs, then this approach is likely to give a reasonable answer. If, however, the common costs are large, so the variation in direct costs are muted in the total stand-alone cost calculation (direct plus common costs), then this measure may not lead to good price signals.

Incremental Costs. This approach uses incremental-costs, which are the additional costs incurred to produce the good above and beyond the costs incurred to produce all other goods. Only fixed costs directly attributable to the incremental good/consumer are included in the measure of costs. All truly common costs are priced at zero.

Avoided Costs. Whereas incremental costs look at the cost of adding production, avoided costs look at the saving of subtracting production. These are the costs that would no longer be incurred should the good cease to be produced. These costs are derived from the resources used exclusively in the production of the good plus the incremental cost of common resources. Similar to the incremental cost approach, truly common costs are not recovered.

I declare under penalty of perjury that the foregoing is true and correct.

Coleman Bazelon

EXECUTED: April 22, 2008

ATTACHMENT A

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Dr. Bazelon is a Principal in the Washington, D.C. office of *The Brattle Group*. His past telecommunications consulting experience includes litigation, regulatory, arbitration, and strategy engagements in the wireless, wire line and video sectors. Dr. Bazelon also has experience with intellectual property valuation and antitrust and damages analysis. He formerly was a principal analyst in the Microeconomic and Financial Studies Division of the Congressional Budget Office where he covered telecommunications issues. His responsibilities also included researching reforms of radio spectrum management; estimating the budgetary and private sector impacts of spectrum-related legislative proposals; and advising on auction design and privatization issues for all research at CBO. He is also an expert on the federal government's use of discount rates for policy and regulatory analysis.

Prior to joining *Brattle*, Dr. Bazelon was a Vice President at the Analysis Group, an economic and strategy consulting firm. During that time, Dr. Bazelon focused to expanding the firm's telecommunications practice area.

Dr. Bazelon received a Ph.D. and an M.S. in Agricultural and Resource Economics from University of California at Berkeley. He also holds a Diploma in Economics from the London School of Economics and Political Science and a B.A. from Wesleyan University.

PUBLICATIONS

White Papers, Reports, Studies and Reviews

"Why the Exclusive Use of Large Licenses in the Upper or Lower 700 MHz Bands Would Reduce the Efficiency of the 700 MHz Auction," FCC filing, WT Docket No. 06-150, April 20, 2007.

"Principles for Choosing 700 MHz Block License Sizes," FCC filing, WT Docket No. 06-150, March 6, 2007.

Thomas W. Hazlett and Coleman Bazelon, "Market Allocation for Radio Spectrum," prepared for International Telecommunications Union Workshop on Market Mechanisms for Spectrum Management, Geneva, Switzerland, January 2007.

"The Economics of License Sizes in the FCC's 700 MHz Band Auction," FCC filing, WT Docket No. 06-150, January 2007.

"Licensed or Unlicensed: The Economics of Incremental Spectrum Allocations," Telecommunications Policy Research Conference, 2006.

"Analysis of an Accelerated Digital Television Transition," sponsored by Intel Corporation, 2005.

Thomas W. Hazlett and Coleman Bazelon, "Regulated Unbundling of Telecommunications Networks: A Stepping Stone to Facilities-Based Competition?" Telecommunications Policy Research Conference, 2005.

Thomas W. Hazlett, Coleman Bazelon, John Rutledge, and Deborah Allen Hewitt, Sending the Right Signals: Promoting Competition Through Telecommunications Reform: A Report to the U.S. Chamber of Commerce, September 22, 2004.

Michael H. Rothkopf and Coleman Bazelon, "Interlicense Competition: Spectrum Deregulation Without Confiscation or Giveaways," New America Foundation, Spectrum Series Working Paper #8, August, 2003.

Review of Discounting and Intergenerational Equity, by Paul Portney and John Weyant, Resources for the Future (1999), in the Society of Government Economists Newsletter, Volume 34, No. 10, November 2002.

Completing the Transition to Digital Television, Congressional Budget Office, September 1999.*

Two Approaches for Increasing Spectrum Fees, Congressional Budget Office, November 1998 (Coauthored with David Moore*).

Where Do We Go From Here? The FCC Auctions and the Future of Radio Spectrum Management, Congressional Budget Office, April 1997 (Coauthored with Perry Beider and David Moore*).

* CBO publications do not cite authors' names.

<u>**Articles and Book Chapters**</u>

Michael H. Rothkopf and Coleman Bazelon, "Interlicense Competition: Spectrum Deregulation Without Confiscation or Giveaways," in Obtaining the Best from Regulation and Competition, Michael A. Crew and Menahem Spiegel, eds., Kluwer Academic Publishers (2005), pp. 135-159.

"Next Generation Frequency Coordinator," Telecommunications Policy 27 (2003), pp. 517-519.

Coleman Bazelon and Kent Smetters, "Intergenerational Discounting," Loyola of Los Angeles Law Review, Vol. 35, Issue 1, November 2002.

Coleman Bazelon and Kent Smetters, "Discounting Inside the Washington D.C. Beltway," Journal of Economic Perspectives, Fall 1999.

"The Movement of Markets," Wesleyan Economic Journal, Spring 1986.

"Is the Psychogenic Theory of History Scientific?" Journal of Psychohistory, Fall 1985.

SEMINARS AND PRESENTATIONS

Market Allocation for Radio Spectrum, International Telecommunications Union Workshop on Market Mechanisms for Spectrum Management, Geneva, Switzerland, January 2007.

Licensed vs. Unlicensed Spectrum: A New Economic Model for Determining the Trade-offs, 34th Annual Telecommunications Policy Research Conference (TPRC), Arlington, VA.

Decoding the Future of IP-TV, Northern California Chapter of the Federal Communications Bar Association, San Francisco, February 2006.

Accelerating the Digital Television Transition, COMPTEL Executive Business & Policy Summit, Washington, D.C., December 2005.

Regulated Unbundling of Telecommunications Networks: A Stepping Stone to Facilities Based Competition? Telecommunications Policy Research Conference, Arlington, VA, September 2005.

Sending the Right Signals: Promoting Competition Through Telecommunications Reform: A Report to the U.S. Chamber of Commerce, presentation of report to the US Chamber of Commerce, October 6, 2004.

Telecommunications Reform, presentation to the US Chamber of Commerce's Technology Policy Committee, April 29, 2004.

Interlicense Competition, Telecommunications Policy Research Conference, Arlington, VA, September 2003.

Marketing & Legal Strategies: Hope, Hype & Crash Landings, WCAI 2003, Washington, D.C., July 10, 2003.

Spectrum Policy Task Force Interference Recommendations, Manhattan Institute Conference, Washington, D.C., February 13, 2002.

FCC License Auctions, Society of Government Economists Conference, Washington, D.C., November 22, 2002.

Spectrum Management Panel, CTIA Wireless 2002, Orlando, FL, March 18, 2002.

A Note on Correlation, ASSA Annual Meetings, Atlanta, GA, January 6, 2002.

Regulatory Forbearance, Powerline Communications Conference, Washington, D.C., December 13, 2001

Spectrum License Valuations, CTIA Wireless Agenda 2001, Dallas, TX, May 2001.

Old Spectrum in the New Economy, with David Moore, invited paper, Society of Government Economists Conference "The New 'Economy': What Has Changed and Challenges for Economic Policy," Washington, D.C., November 2000.

Discounting Inside the Washington D.C. Beltway, Energy Information Agency Seminar Series, Washington, D.C., March 2000.

Discounting Inside the Washington D.C. Beltway, Congressional Budget Office Seminar Series, Washington, D.C., November 1999.

Completing the Transition to Digital Television, Telecommunications Policy Research Conference, Arlington, VA, September 1999.

Digital Television Transition, Congressional Budget Office Seminar Series, Washington, D.C., April 1999.

The Budgetary Treatment of Asset Sales, briefing for the staff of the Senate Budget Committee, Washington, D.C., February 1997.

The Value Added from Multilateral Bargaining Theory for Applied Research, with Greg Adams, Selected Paper, AAEA Annual Meeting, Baltimore, MD, August 1992.

The Importance of Political Markets in Formulating Economic Policy Recommendations, Selected Paper, AAEA Annual Meeting, Manhattan, KS, August 1991.

L.D.C. Debt and Policy Linkages in the Determination of World Commodity Prices, with Gordon Rausser, Selected Paper, AAEA Annual Meeting, Vancouver, B.C., Canada, August 1990.

TESTIMONY AND DECLARATIONS

"Concerning the Effects of the Fixed Rent Charged for Access to the Massachusetts Turnpike," *The Massachusetts Turnpike Authority v. Level 3 Communications, LLC, et al.,* The United States District Court for the District of Massachusetts, Civ. Act. No. 06-11816, November 12, 2007.

"Affidavit of Dr. Coleman Bazelon," *Gulfside Casino Partnership v. Mississippi Riverboat Council, et al.*, United States District Court for the Southern District of Mississippi, Southern Division, Cause No. 1:07-CV-110-LG-JMR, May 4, 2007.

"Rebuttal Report of Dr. Coleman Bazelon," *Level 3 Communications, LLC, v. City of St. Louis, Missouri*, United States District Court for the Eastern District of Missouri, Eastern Division, Consolidated Case No. 4:04-CV-871 CAS, June 17, 2005.

"Affidavit of Dr. Coleman Bazelon," *Informed Communications Systems, Inc. v. Intelogistics Corp., d/b/a Prosodie Interactive*, United States District Court, Southern District of Florida, Miami Division, Case No.: 04-61245 CIV Huck/Turnoff (October 12, 2004).

"Declaration of Thomas W. Hazlett, Ph.D., Prof. Arthur M. Havenner, and Coleman Bazelon, Ph.D.," In the Matter of Review of the Commission's Ruling Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers (WC Docket No. 03-173), December 16, 2003.

"Declaration of Thomas W. Hazlett, Ph.D., Arthur M. Havenner, Ph.D., and Coleman Bazelon, Ph.D.," In the Matter of Petition for Forbearance From the Current Pricing Rules for the Unbundled Network Element Platform (WC Docket No. 03-157), September 2, 2003.

"Spectrum Deregulation Without Confiscation or Giveaways," with Michael Rothkopf, Comment in the Matter of Issues Related to the Commission's Spectrum Policies (ET Docket No. 02-135), January 9, 2003.

Thomas W. Hazlett, Coleman Bazelon and Arthur Havenner, "Forecast of Toll Free Number Demand: 2002-2004," Attachment A, SMS/800 Transmittal No. 22, F.C.C. Tariff No. 1, November 15, 2002.

"Comments of Coleman D. Bazelon and T. Christopher Borek Relating to Arthur D. Little, Inc.'s Assessment of the Impact of DTV on the Cost of Consumer Television Receivers," *Ex Parte* Communication to the Federal Communications Commission in the Matter of Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television (MM Docket 00-39), August 1, 2002.

"Use Administrative Law Judges to Adjudicate Interference Disputes Between Licensees," Comment in the Matter of Issues Related to the Commission's Spectrum Policies (ET Docket No. 02-135), July 8, 2002.

REVIEWER

- *American Journal of Agricultural Economics*
- *Congressional Budget Office Reports*
- *Telecommunications Policy*

EXPERT DESIGNATIONS

- *Touch America, Inc. v. Qwest Communications International, Inc.*
  - Designated as an expert in Arbitration (June 2003)
- *Informed Communications Systems, Inc. v. Intelogistics Corp., d/b/a Prosodie Interactive*, United States District Court, Southern District of Florida, Miami Division, Case No.: 04-61245 CIV Huck/Turnoff
  - Filed affidavit (October 12, 2004)
- *Level 3 Communications, LLC v. City of St. Louis, Missouri*, United States District Court for the Eastern District of Missouri, Eastern Division, Consolidated Case No. 4:04-CV-871 CAS
  - Filed Rebuttal Report (June 17, 2005)
  - Deposition (July 14, 2005)
- *Cable Merger before the FTC*
  - Presented analysis to FTC staff (March 20, 2007)
- *Gulfside Casino Partnership v. Mississippi Riverboat Council, et al.*, United States District Court for the Southern District of Mississippi, Southern Division, Cause No. 1:07-CV-110-LG-JMR
  - Filed affidavit (May 4, 2007)
- *Motorola, Inc. v. State of Mississippi Department of Information Technology Services and M/A-Com, Inc.*, Chancery Court of Hinds County, Mississippi, Cause No. G2006-2179 S/2
  - Testified (May 23, 2007)
- *American Towers, Inc. v. Jackson & Campbell, P.C., et al.*, D.C. Superior Court, No. 003277-06
- *The Massachusetts Turnpike Authority v. Level 3 Communications, LLC, et al.*, The United States District Court for the District of Massachusetts, Civ. Act. No. 06-11816
  - Filed Expert Report (November 12, 2007)

SELECTED CONSULTING PROJECTS

<u>Litigation</u>

- Assessed the capital adequacy of the US branch of a foreign bank
- Assessed changes in contributions to the Cable Royalty Fund on behalf of Sports Claimants in a Copyright Arbitration Royalty Panel (CARP) proceeding
- Assessed damages associated with infringement of patents used in DNA fingerprinting applications
- Examined the business case asserted for a small wireless reseller in a breach of contract litigation
- Assessed a bankruptcy sale proposal for a national tier 1 broadband backbone provider
- Assessed the market for Competitive Local Exchange Carriers in an SEC fraud case

- Researched the basis for generally optimistic beliefs about the telecommunications sector in the late 1990s in a 10-b securities litigation
- Researched the basis for generally optimistic forecasts of broadband deployment in the later 1990s and early 2000s in an anti-trust litigation
- Estimated damages in a breach of contract case involving the sale of a fibre optic network
- Valued digital television radio spectrum in St. Louis in the pre-litigation phase of a breach of contract dispute
- Assessed basis for guidance of a large telecommunications firm in a 10-b securities litigation
- Assessed damages associated with infringement of patents used to provide Voice over Internet Protocol (VoIP)
- Provided written testimony estimating the value of a surety bond in a contract dispute involving toll free phone numbers used in an enhanced service application
- Estimated "Loss of Use" damages for a severed fibre optic cable
- Assessed commonality issues of physicians for class certification of RICO action against a set of health insurance companies
- Analyzed the economic underpinnings of an exclusivity clause of a mobile phone affiliation agreement
- Estimated cost of delay in granting local cable franchise
- Estimated recoverable data costs for two pesticides
- Assessed the damages associated with the infringement of patents related to VoIP technology and the likely impact of a permanent injunction
- Estimated damages associated with USF and other telephone taxes paid by a calling card reseller
- Provided written testimony on economic value associated with items provided in a labor Neutrality agreement
- Provided oral testimony on the proprietary nature of specific information contained in a statewide public safety network bid

Regulatory Proceedings

- Provided written testimony of a forecast of toll free number demand for the toll free number administrator, SMS/800, in a rate case proceeding
- Provided written testimony that assessed the validity of an analysis of the costs of a DTV tuner mandate
- Assessed the degree of market overlap of two food service firms for purposes of merger review
- Examined the impact of irreversible investments in the local telephone network on the TELRIC pricing methodology
- Estimated the adjustment to the TELRIC pricing formula to account for irreversible investment in the local telephone network

- Provided written testimony examining the effects of unbundling regulations on capital spending in the telecommunications sector
- Provided written testimony refuting analysis purporting to show a positive relationship between UNE-P and telecom network investment
- Assessed the impact on consumers of California's Telecommunications Consumer Bill of Rights proposal
- Examined and refuted arguments suggesting that the California Telecommunications Consumer Bill of Rights was an appropriate response to market failures
- Examined federalism issues related to mobile telephony regulation
- Examined the relative merits of licensed versus unlicensed radio spectrum and the effects of "underlay" licenses on existing commercial licensees
- Analyzed economic ramifications of à la carte cable channel pricing on consumers and the cable and television programming industries
- Developed and assessed Indian spectrum management proposals
- Analyzed impact of local franchise requirements on competition in the video marketplace
- Assessed proposed regulation of mobile phone roaming rates
- Presented analysis on pricing differentials in overlapping cable markets
- Analyzed the relationship between size of cable systems and the economics of the programming market
- Estimated economic impact of ITC Exclusion Order on cell phone handsets

<u>**Other**</u>

- Examined the effects of unbundling regulations on broadband penetration internationally
- Assessed the business cases for IRU swaps of a large international fibre optic network owner
- Coauthored a report to the US Chamber of Commerce on the economic effects of telecommunications deregulation
- Coauthored a report on the value of a portfolio of patents used to provide Voice over Internet Protocol (VoIP)
- Analyzed proposed accelerated digital television transition impacts on society and the federal budget
- Valued proposals to re-band the Upper 700 MHz Band of radio spectrum
- Analyzed cable franchising requirements
- Analyzed Universal Service Fund expenditures
- Provided framework to estimate impact of the effect of designation of TV white spaces as unlicensed on 700 MHz auction receipts
- Advised bidder in AWS spectrum license auction

- Authored several reports on the 700 MHz auction rules
- Analyzed the economics of the military's build versus buy decision for broadband satellite communications capacity
- Assessed the budgetary impacts of legislation to license the TV white spaces
- Estimated the value of a portfolio of spectrum licenses

EXHIBIT 2

AMERICAN TIMBER AND STEEL

FORMERLY MIDWESTERN WHOLESALERS, INC.

June 21, 2007

SYP Round Unframed Poles . 60 CCA as of 06/21/07				
Item	Stocked	Pieces Per Unit	Unit Price – per Each	Piece Price – per Each
Class 5 - 25'	##	12	$79.95	$86.95
Class 6 - 25'		12	$72.50	$79.20
Class 7 - 25'	##	12	$63.25	$68.50
Class 9 - 25'	##	12	$50.60	$54.10
Class 2 - 30'		12	$172.20	$190.65
Class 3 - 30'		12	$151.15	$167.35
Class 4 - 30'		12	$132.20	$146.35
Class 5 - 30'	##	12	$111.00	$122.85
Class 6 - 30'		12	$99.15	$109.80
Class 7 - 30'		12	$87.60	$97.00
Class 9 - 30'	##	12	$70.80	$78.35
Class 2 - 35'		10	$210.95	$229.25
Class 3 - 35'	##	10	$197.75	$215.05
Class 4 - 35'	##	12	$171.60	$190.00
Class 5 - 35'	##	12	$145.40	$161.00
Class 6 - 35'		12	$126.00	$139.50
Class 7 - 35'		12	$103.20	$114.30
Class 1 - 40'		6	$313.20	$346.75
Class 2 - 40'		6	$280.95	$311.05
Class 3 - 40'		8	$257.75	$285.35
Class 4 - 40'		10	$235.65	$260.90
Class 5 - 40'	##	10	$208.35	$230.65
Class 6 - 40'		10	$156.70	$173.50
Class 1 - 45'		6	$379.25	$419.90
Class 2 - 45'		6	$324.25	$359.00
Class 3 - 45'		6	$293.85	$325.30
Class 4 - 45'		8	$259.80	$287.65
Class 5 - 45'	##	8	$240.05	$269.90
Class 1 - 50'		4	$443.60	$474.15
Class 2 - 50'		4	$373.10	$398.85
Class 3 - 50'		6	$347.65	$371.65
Class 4 - 50'		6	$295.80	$316.20
Class 1 - 55'		4	$500.35	$534.85
Class 2 - 55'		4	$428.40	$457.95
Class 3 - 55'		4	$385.70	$412.30

**Prices are FOB Norwalk, Ohio

**Call for availability of poles

**All prices subject to change without notice

**Mix & Match sizes available

Call, Fax, or email Tyler Wasserman at tyler@amtim.com

Toll Free 1-800-551-9663 / 1-419-668-7537 Fax